CLOCKS
FOR
AERIAL NAVIGATION

PREPARED IN THE OFFICE OF
THE DIRECTOR OF AIR SERVICE

JULY, 1919

WASHINGTON
GOVERNMENT PRINTING OFFICE
1919

WAR DEPARTMENT
Document No. 919
Office of The Adjutant General
(2)

WAR DEPARTMENT,
WASHINGTON, *July 31, 1919.*

The following publication, entitled "Clocks for Aerial Navigation," is published for the information and guidance of all concerned.

[062.11, A. G. O.]

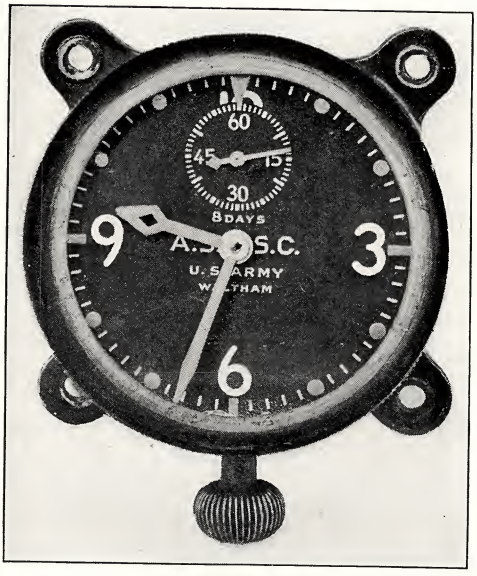
BY ORDER OF THE SECRETARY OF WAR:

PEYTON C. MARCH,
General, Chief of Staff.

OFFICIAL:

P. C. HARRIS,
The Adjutant General.

131702—19



CLOCK.

5-1

CLOCK.

1. Use.

The need of a timepiece on an airplane is so apparent that a discussion of the purpose is almost needless; however, some of the more important uses may be pointed out.

In the first place, until reliable gasoline level gages are developed and put in use, a clock is needed to warn the pilot of a low fuel supply. A pilot should know the amount of gasoline his machine carries and the amount used per hour by the motor or motors, watch his time in the air, and plan to return to the airdrome or pick a safe landing field before his gas is all gone.

In the second place, in cross-country flying of any nature, it is generally advisable to make some estimate of the ground speed of the airplane. Since there is no ground-speed meter available, the clock is needed to take the time required for passing over known distances, from which the ground speed can be estimated.

Again, in verifying or determining the conditions for maximum rate of climb the clock, along with the altimeter, is necessary, unless an altigraph is used, as would be the case of a regular performance test.

2. Construction.

The type of clock used is shown in the figure. It is stem-set and stem-wind, and lugs extend out from the back of the case by which it is fastened to the instrument board with screws. The hour, minute, and second hands are all covered with luminous material, and also the hour marks on the dial.

The movement of this clock is a seven-jeweled watch movement, but the power plant consists of two long mainsprings, so that it requires winding only once in eight days. Specifications (see No. 27007–C) require that the total daily rate of gain or loss, including variations due to temperature changes and vibration, shall not be greater than 70 seconds per day. It has been found by careful observation of clocks in use on airplanes that the average rate is much less than this. It is essential that the clocks should be wound *regularly*. Once a week is sufficient, but a better rate is obtained by more frequent winding, provided it is regular, every day or on alternate days, etc. This should be the duty of some one man and not intrusted to several. If the clock fails to keep time it should be sent to the instrument repair shop for repair and adjustment.

References.

B. A. P. Specifications No. 27007–C.
P. E. D. Drawings No. 0–K–35.